luminous objects to the volcanic dust of the eruption of Krakatoa of August 27, 1883. In *La Nature* M. Tissandier describes the corona as observed in two balloon ascents on October 23 and 24.

M. HENRI MAGET is about to publish in Paris an atlas of the French colonies and foreign possessions. The work, which will consist of twenty-five maps, will be brought out with the assistance of eminent French colonial geographers. The maps will be of large size, in three or four colours, and some of them have obtained a silver medal and a diploma of honour, at the recent Geographical Exhibition at Bar-le-Duc. It will be completed in five parts, the first of which has already appeared. This contains maps of (1) New Caledonia, (2) Central Africa (the Congo and the Gaboon), (3) Tonquin, (4) Madagascar, (5) the Grand Duchy of Luxemburg. The second part will contain maps of Réunion, Tahiti, Guadaloupe, Senegal, and the New Hebrides.

WE have again to welcome the appearance of a new edition (the tenth) of Prof. Morren's most useful "Correspondance botanique." Since the appearance of the ninth edition (in 1881) the list of "gardens, chairs, museums, and botanical reviews and societies throughout the world," including also the addresses of all private working botanists known to the editor, has again undergone considerable enlargement—we hope an indication of a gradual spreading of interest in botanical science.

DR. BRUDENELL CARTER has issued in a separate form his now celebrated letter to the *Times* on "Eyesight and Civilisation" (Macmillan and Co.). He has taken the opportunity to introduce a few explanatory diagrams.

PROF. F. W. PUTMAN has sent to the *Leader* a full account of his recent explorations amongst the so-called Liberty Group of Mounds on the Harness estate, Ohio, first surveyed and described by Squier and Davis in 1840. In their great work on "The Ancient Monuments of the Mississippi Valley" these archæologists describe five small mounds within the great square of twenty-seven acres. Most of these, as well as three others represented on their plan just outside a "gateway" on the east side of the larger forty-acre square have been much reduced by cultivation. All have now been carefully examined, two—evidently burial-places—yielding objects of considerable interest. The human bones were much decayed; but amongst the other finds were copper plates, ear-rings, and celts, slate and stone ornaments, some large beads covered with copper, and in one instance with silver over the copper, and many other objects, all of which have been deposited in the Museum of Cambridge University. In another large mound north of the same spot an extensive bed of ashes and charcoal yielded much pottery, pieces of cut mica, some grass matting with charred seeds, nuts, acorns, and bones. Near the eastern corner of the great square stands the largest mound of the whole group, which in future Reports of the Peabody Museum will be referred to as the "Big Mound of the Liberty Group." It is 160 feet long by 80 to 90 wide, and 13 to 18 high, and appears from the portion so far examined to be a burial-place of a remarkable character. Some 40 feet from the centre, at the northern end, twelve chambers were opened, and yielded charred mats and cloth in which the bodies had evidently been wrapped, besides various burnt objects, such as copper plates, ear-rings, shell beads, and long flint knives. In two of the chambers skeletons were found stretched at full length, with a copper plate on one of them, the action of which had preserved the structure of a finely-woven piece of cloth. In the other chambers the bodies had been burnt on the spot, as shown by the relative position of the bones and by the fact that in two instances portions of the bodies had fallen beyond the fire, and so escaped burning. Other discoveries made early in the present year in two of the pits by some boys, under the guidance of Mr. Wilson, yielded a great variety of objects which have also been secured for the Peabody Museum. Important links have thus been obtained between the builders of this great mound and neighbouring earth-works in the Scioto Valley and the constructors of the remarkable group on the Turner estate in the Little Miami Valley.

MR. ELLIS, of 90, New Bond Street, has now on exhibition a number of garments, fur-lined and fur-covered, which were used by the German Polar Expeditions of 1882. In both cases the furs were hardly worn at all. The first expedition, which wintered from August 21, 1882, to September 12, 1883, in Kingawa Fjord, Cumberland Gulf, 60° 15′ W. longitude and 60° 36′ N. latitude, and as there was a perfect calm through the winter, the furs were not necessary; similarly the second expedition, which wintered in the island of South Georgia (36° 5′ W. longitude and 54° 32′ S. latitude) from August 21, 1882, until September 5, 1883, found the temperature equally mild. The furs were lent for exhibition by the Imperial German Polar Commission.

THE last census of Roumania gives a total population of 4,424,961, of which 2,276,558 are males, and 2,148,403 are females. According to religious sects there are 4,198,664 orthodox Greeks, 134,168 Jews, 45,152 Roman Catholics, 28,903 Protestants, 8734 Gregorians, 8108 Armenians, and 1323 Mohammedans. The foreign element in the population is composed as follows:—28,128 Austrians, 9525 Greeks, 3658 Germans, 2822 English, 2706 Russians, 2631 Turks, 1142 French, 167 Italians, and 539 of various nationalities—in all 51,138 persons. The urban population numbers only 781,170, while the rural population is 3,643,783.

ON October 16 a mirage was seen at Lindesberg, in Central Sweden. It represented a large town with four-storied houses, a castle, and a lake. The phenomenon was observed for about fifteen minutes.

THE red sun-glows have recently been observed in the far north of Sweden.

THE additions to the Zoological Society's Gardens during the past week include a Barbary Ape (*Macacus innuus*) from North Africa, an Anubis Baboon (*Cynocephalus anubis*) from West Africa, a Siamese Blue Pie (*Urocissa magnirostris*) from Siam, presented by Mr. R. B. Colom; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. C. M. Courage; six Alexandrine Parrakeets (*Palæornis alexandri*), a Blossom-headed Parrakeet (*Palæornis cynocephalus*), a Banded Parrakeet (*Palæornis fasciatus*), from British Burmah, presented by Mr. Eugene W. Oates, F.Z.S.; two Ring-necked Parrakeets (*Palæornis torquatus*) from India, presented respectively by Mr. W. G. Burrows and Miss Perry; a Weka Rail (*Ocydromus australis*, white var.) from New Zealand, presented by Mr. J. Satchell Studley; a Brown Capuchin (*Cebus fatuellus*) from Guiana, two Pronghorn Antelopes (*Antilo apra americana* ♂ ♀) from North America, deposited; a Great Grey Shrike (*Lanius excubitor*), six Curlews (*Numenius arquata*), British, purchased; a Blue-winged Teal (*Querquedula cyanoptera* ♂) from South America, received in exchange.

VARIATION OF THE ATOMIC WEIGHTS

THE annexed list contains all the elements except a few very little investigated. If the whole numbers in columns are taken to be each the weight of nine atoms in the gaseous state, and a comparison is made with the best determinations of vapour-densities on record, the result is as follows. The first nineteen determinations are Deville and Troost's, and are to be found in *Comptes Rendus*, xlv. (1857) p. 823; lvi. (1863) p. 893; lx. (1865) p. 1222; lxiii. (1866) p. 20.

	Vols.	Observed at	Calc. sp. gr.	
$3P_6$ =	1		4·433	
		500° & 1040°	4·425	
$3As_6$ =	1		10·529	
		564	10·6	
$3Se_2$ =	1		5·5416	
		1420	5·68	
$3Te_2$ =	1		9·0513	
		1390 & 1439	9·04	
$3Cd$ =	1		3·9253	
		1040	3·94	
$3Al_3Cl_3$ =	1		9·3514	
		350 & 440	9·348	
$3Al_3Br_3$ =	1		18·772	
		440	18·62	
$3Fe_2Cl_3$ =	1		11·3834	
		440	11·395	
$3Ta_4Cl_4$ =	2		9·836	
		350	9·6	
$3Nb_3Cl_5$ =	2		9·5208	
		350	9·6	
$3Nb_3Cl_3O_2$ =	2		7·654	
		440 & 860	7·88	
$3Zr_4Cl_4$ =	2		8·0815	
		440	8·15	
$3Hg_2Cl$ =	2		8·3085	
			8·21	
			8·35	Mitscherlich
$3H_4N_3Cl$ =	4		0·9294	
		350 & 1040	1·005	
$3H_4N_3Br$ =	4		1·7144	
		860	1·71	
$3H_4N_3I$ =	4		2·5457	
		440	2·59	
$3H_3N_3C_4H_5Cl$ =	4		1·4143	
		350	1·44	
$3H_4N_3ClHgCl$ =	4		3·3134	
		440	3·5	
$3H_4N_3IHgI$ =	4		6·546	
		350	6·49	
$3Cl$ =	1		2·47	
			2·47	Berzelius
$3Br$ =	1		5·611	
			5·54	Mitscherlich
$3I$ =	1		8·9358	
			8·89	V. Meyer
$3Hg$ =	1		7·0655	
			7·03	Mitscherlich
$3HgCl$ =	1		9·536	
			9·8	Mitscherlich
$3As_6O_6$ =	1		13·854	
			13·85	Mitscherlich
$3P_3S_5$ =	1		7·758	
			7·67	V. & C. Meyer
$3P_3Cl_3$ =	2		4·814	
			4·85	Mitscherlich
			4·875	Dumas
$3As_3Cl_3$ =	2		6·3383	
			6·3	Dumas
$3Bi_3Cl_3$ =	2		11·1871	
			11·16	Jacquelain
$3PbCl$ =	1		9·536	
At 1046°–1089° mean of 4 exp. =			9·5	Roscoe[1]
$3Ti_4Cl_4$ =	2		6·8808	
			6·836	Dumas
$3Sn_4Cl_4$ =	2		9·1898	
			9·199	Dumas
$3Si_4F_4$ =	2		3·6944	
			3·6	Dumas
$3Si_4Cl_4$ =	2		5·9572	
			5·939	Dumas
$3Sb_3Cl_3$ =	2		8·07	
			8·1	Roscoe & Schorlemmer ("Chemistry")
$3Sb_3(C_4H_5)_3$ =	2		7·3773	
			7·438	Löwig & Schweitzer[2]
$3In_2Cl_3$ =	2		7·7698	
			7·87	V. & C. Meyer

[1] *Proc. Roy. Soc.* xxvii. p. 427. [2] *Journ. Chem. Soc.* v. p. 69.

The agreement in all cases is such that, considering the difficulties with which the determination of vapour-densities is attended, it is not likely that other atomic weights could be chosen to obtain like good results. If now the weights in column *t* are taken to be the weights of a single atom for each element in a certain solid or liquid state, the percentages of oxygen in the following chlorates agree closely with the values found by experiment,[1] to wit:—

$100AgClO_6$	contain	25·0525 O	
	found	25·0795 O	Stas
	,,	25·088 O	Marignac
$100AgBrO_6$	contain	20·34 O	
		20·349 O	Stas
$100AgIO_6$	,,	16·9619 O	
		16·9747 O	Stas
		17·047 O	Millon
$100KBrO_6$	,,	28·7307 O	
		28·6755 O	Marignac
$100KIO_6$	,,	22·4227 O	
		22·473 O	Millon
$100NaClO_6$	,,	45·0672 O	
		45·0705 O	Penny

The agreement in these instances is as good as with the adopted weights; but it is complete also in the following cases, in which there are great discrepancies with the prevailing atomic weights:—

$100PtCl_2KCl$ contain	69·362 $PtCl_2$ and	30·638 KCl		
	69·417 ,,	30·583	,,	Berzelius
	69·318 ,,	30·682	,,	Seubert
Mean	69·3675 ,,	30·6325	,,	
,, ,, yield		117·825 AgCl		
		117·9606	,,	Seubert

The agreement of the mean of the percentages of Berzelius and Seubert with the calculated values is complete; the discrepancy between the amounts of silver chloride is small and within the limits of errors of observation. But the percentages of platinum and chlorine in $PtCl_2$ arrived at by the two experimenters are widely different, viz.:—

40·424 Pt; 28·993 Cl Berzelius
40·107 ,, ; 29·211 ,, Seubert

The true weight of the chlorine follows from Seubert's analysis of the ammonium salt—

$100H_4N_3PtCl_3$ yield 194·954 $(AgCl)_3$
Seubert obtained 192·846 ,,

His rate between the silver chloride and the potassium salt gives ... } Pt = 195·002 Clarke
His rate between the silver chloride and the ammonium salt gives ... } ,, = 196·871 ,, ;

the latter rate is therefore at fault, and 100 parts of the ammonium salt correspond to 194·694 AgCl, if the rate is the same as with the potassium salt; the difference between this number and 194·954 is within the limits of errors of observation. The rate $\frac{100}{194·954} \times (AgCl_3)_3$ gives $H_4N_3ClPtCl_2 = 70·84883$, and the rate $\frac{69·362}{30·538} \times KCl$ gives $PtCl_2 = 53·95833$; H_4N_3Cl is therefore 16·8905, and as the weight of H_4N_3 is not in doubt and = 5·74468, Cl is = 11·14583, as in column *t*. With this weight of chlorine all discrepancies disappear, while the weights recalculated from the same data vary between Pt = 194·314 and 196·871. It is moreover minutely confirmed by the results obtained from all the other elements of the same group.

$100OsCl_2KCl$ contain } 41·0226 Os; 28·5027 Cl; 30·4747 KCl
40·638 ,, 28·9024 ,, 30·4596 ,, Berzeliu

Berzelius's percentage of chlorine is again too large, very nearly to the same extent as the chlorine found by him in the potassio-platinum chloride, while the percentage of the potassium chloride is very exact.

[1] The experimental values are those recalculated by Prof. F. W. Clarke ("Smithsonian Miscell. Coll.," vol. xxvii.).

100$IrCl_2N_3H_4Cl$ contain	44·3691 Pt				
	43·732 ,,				Seubert
100$IrCl_2KCl$ contain	40·3874 ,, ;	28·8097 Cl ;	30·803 KCl		
	39·88 ,,	29·291 ,,	30·82 ,,		Seubert
		29 ,,			Berzelius

The same discrepancies as in the case of the platinum salts present themselves: as the percentage of the potassium chloride is exact, that of $IrCl_2$ follows; and, as to the weight of the chlorine, the difference of the percentages found by the two experimenters shows that there is the same cause of error as in the corresponding platinum salt.

100$PdCl_2.2KCl$ contain	32·678 Pd ;	21·4512 Cl ;	45·8708 KCl	
	32·69 ,,	21·416 ,,	45·892 ,,	Berzelius

The agreement is here as good as complete; but the values actually derived from these data vary from Pd = 104·674 to 110·796, owing to the value of the weight assumed for chlorine.

100$Rh.Na_3Cl_3.Cl_3$ contain—

27·1468 Rh ;	45·6215 NaCl ;	27·2317 Cl	
27·094 ,,	45·577 ,,	27·329 ,,	Berzelius

100$Rh.2KCl.Cl_3$ contain—

29·1276 Rh ;	41·6537 KCl ;	29·2187 Cl	
28·989 ,,	41·45 ,,	29·561 ,,	Berzelius

The agreement is almost complete in the case of the sodium salt, and not doubtful in the other, because the weight of KCl is certain. The values for rhodium derived from the sodium salt are very discordant, varying from 102·98 to 105·696.

100$Ru.2KCl.Cl_3$ contain	28·9984 Ru ;	41·7297 KCl ;	29·2719 Cl	
Numbers actually found	28·96 ,,	41·39 ,,		Claus
Mean of the 3 experiments	28·78 ,,	41·09 ,,	30·17 ,,	Claus

The calculated amount of ruthenium is undoubtedly the actual percentage, because 28·91 Ru were found in the second experiment as 28·96 in the first; and the weight of KCl not being doubtful, that of chlorine can only be as calculated. The results which have been derived from these data are most discordant, viz. Ru 96·854—107·19.

The weights of column *s* give $O_6 = 16$ and $S_3 = 16$; those of column *t*, $O_6 = 15·31914$, $S_3 = 15$. . . . There is consequently a difference of the chemical proportions in the two states which explains many anomalies encountered in analytical work, and among others the following:—Berzelius observes (*Pogg. Ann.* viii. p. 16) that, from causes which he has been unable to discover, the atomic weight of sulphur cannot be derived from the specific gravities of the gaseous compounds H_2S and SO_2, the numbers obtained being so high that the discrepancies exceed the limits of possible errors of observation. He had obtained S = 201·165 from the analysis of $PbSO_4$; Thénard and Gay-Lussac's weighing of H_2S gave S = 203·9; his own weighing of SO_2, 207·58. His weight for O being 100, these 207·58 S represent 407·58 SO_2, which with $S_3 = O_6$ give S = 203·79, practically the same as the value derived from the other gaseous compound. The two numbers 203·9 and 203·79 reduced to the value of the weights of column *t* give respectively 191·056 and 191·053. Berzelius's number 201·165 corresponds to the value of column *t*, H being = 1; with H = 0·95745, the actual weight, it becomes 192·605. The three numbers in hydrogen units—15·292, 15·284, and 15·408—though from different causes all too large, agree with each other as well as can be expected under the circumstances, and the difficulty disappears therefore with the adoption of the weights of columns *s* and *t* for the two different states.

This being so, it is to be expected that for other states the weights will also be still further different, and this conclusion is fully confirmed by the facts. Let the weights of column *t* be = 1, then the weights of the states *a*, *b*, and *c* are as follows:—

$$a = 0·999104 ;\ b = 0·997338 ;\ c = 0·99468.$$

Instead of such loss of weight there may be a gain to the same extent, as, for instance, in the state $\frac{1}{b} = 1·002662$. There are still other variations which are multiples of *a*, *b*, *c*, as—

$$a^{\frac{3}{2}} = 0·99866 ;\ \frac{c^2a}{2} = 0·99424 ;\ cb = 0·99203.$$

The evidence of the reality of these weights appears from the following comparison with some of the very best experiments on record. The numbers marked with an asterisk are derived by the volumetric method, which, in consequence of variation of the atomic weights, yields in all cases more or less faulty results.

100$KClO_6$ contain ...	60·87379 KCl = 1		
	60·81927 ,, = *a*		
Mean	60·84653		
Mean of all experiments on record	60·846 ,,		Berzelius, Penny, Pelouze, Marignac, Gerhardt, Maumené, Stas
100Ag = *c* yield ...	132·8426 AgCl		
Mean of all experiments on record	132·8418 ,,		Berzelius, Turner, Penny, Marignac, Maumené, Dumas, Stas
100Ag correspond to	69·0244 KCl = *a*		
*	69·062 ,,		Marignac
*	69·10345 ,,		Stas
100Ag yield	114·8733 AgS = $a^{\frac{3}{2}}$		
	114·8581 ,,		Dumas, Stas, Cooke
100AgCl yield ...	86·4733 ,, = $a^{\frac{3}{2}}$		
	86·4733 ,,		Berzelius, Svanberg, and Struve
100Ag correspond to	54·1258 NaCl		
	*54·2076 ,,		Pelouze, Dumas, Stas
100Ag yield	157·4707 AgN_3O_6 = *b*		
Mean of 7 experiments	157·472 ,,		Stas
Mean of all experiments on record	157·479 ,,		Penny, Marignac, Stas
100AgN_3O_6 correspond to	84·35994 AgCl		
	84·3743 ,,		Turner, Penny
100AgN_3O_6 correspond to	43·8331 KCl = *a*		
	*43·8715 ,,		Marignac, Stas
100KCl = *a* yield ...	135·6532 KN_3O_6 = *c*		
	135·6423 ,,		Stas
	135·6345 ,,		Penny
100$KClO_6$,, ...	82·5033 ,,		
	82·500 ,,		Penny
100$NaClO_6$,, ...	79·8917 NaN_3O_6 = $\frac{c^2a}{2}$		
	79·8823 ,,		Penny
100NaCl ,, ...	145·435 ,, = $\frac{c^2a}{2}$		
	145·4164 ,,		Penny
	145·4526 ,,		Stas
100$AgC_4H_3O_4$ = *c* contain	64·6608 Ag		
	64·664 ,,		Marignac
	64·6065 ,,		Liebig and Redtenbach
100$AgC_4H_2O_6$ = *c* contain	59·3367 ,,		
	59·2806 ,,	,,	,,
100$AgC_4H_2O_5$ = *c* contain	62·0621 ,,		
	62·0016 ,,	,,	,,
100BaCl yield ...	138·0494 AgCl		
	138·07 ,,		Berzelius
,, ,, ..	112·251 $BaSO_4$		
	112·19 ,,		Turner
	112·175 ,,		Berzelius
100$CaCO_3$ = *c* yield	56·0312 CaO = 1		
General mean ...	56·0198 ,,		Dumas, Erdman, and Marchand
100$CaCO_3$ = *c* yield	136·0037 $CaSO_4$ = 1		
	136·0525 ,,		Erdman and Marchand
100Pb ,,	146·4418 $PbSO_4$		
	146·4262 ,,		Berzelius, Turner, Stas
100PbO ,,	135·853 ,,		
	135·804 ,,		Turner

100$PbSO_4$ yield	109·2444	$PbN_3O_6 = b$	
	109·307	,,	Turner
100Pb ,,	159·98	,,	
	159·9743	,,	Stas
100$PbN_3O_6 = b$,,	67·3799	PbO = 1	
	67·4016	,,	Svanberg
100AgCl correspond to	29·5607	LiCl = $\frac{1}{b}$	
	29·584	,,	Mallet, Troost
100Ag correspond to	39·2692	,, = $\frac{1}{b}$	
	*39·358	,,	Stas
100LiCl = $\frac{1}{b}$ yield	162·6508	$LiN_3O_6 = c$	
	162·5953	,,	Stas
100Tl yield	130·38969	$TlN_3O_6 = b$	
Experiment 8 ..	130·3897	,,	Crookes
Mean of 10 experiments	130·391	,,	,,

100$G_3O_3(SO_3)_3.12HO = c$ contain—

	14.1694	GO	
	14·169	,,	Nilson and Pettersson

100$MgC_2O_4H_2O_2 = c$ contain—

	27·338	MgO = 1	
	27·3665	,,	Svanberg & Nordenfeldt
100$MgCO_3 = c$ contain	47·6	,,	
Mean of 19 experiments	47·627	,,	Marchand and Scheere

100$H_4N_3.SO_4.3AlOSO_3.24HO = cb$ contain—

	11·2814	AlO	
Mean of 10 experiments	11·2793	,,	Mallet

100$H_4N_3SO_4.3GaOSO_3.24HO = cb$ contain—

	18·9325	GaO	
	18·9596	,,	Lecoq de Boisbaudran

These determinations include the most classical labours on record, and the general agreement with the calculated numbers is surprising, and the more conspicuous in the cases in which the efforts of the experimenters to exclude error have been pushed to the utmost limits, as in Stas's syntheses and in Prof. Crookes's synthesis of thallium nitrate. Notwithstanding the difficulty in this case, because the element is the heaviest of all so far discovered, one experiment has yielded the identical calculated number, and the mean of all deviates from it only by 0·00131. Moreover the same weights recur in similar compounds; all nitrates, for instance, have a lower value than the corresponding chlorides and sulphates, and the value is the lower the greater the composition, as in the alums. The evidence is such that no doubt seems to be admissible as to the reality of a variation of the atomic weights. This conclusion is independent of any value of the atomic weights; for the discrepancies exhibited in the results of Prof. Clarke's recalculations from the same experimental data above quoted are inevitable if the variation of the atomic weights is not taken into account. In c units Ag is 108·09679 if H = 1, calculated from the weights of column t; Cl in the gaseous state is = 35·66; the calculated weights correspond therefore, within the limits of experimental errors, to the atomic, but the weights are those of different states.

The difference between the weights of the gaseous and the other states is very considerable; the weight of 3 molecules of $H_4N_3I.HgI$, for instance, is = 378 in the state of gas, 354·734 in t units, 352·847 in units = c; the discrepancies are so great that they exceed by far the limits of possible errors, and as from the comparisons made it appears certain that the different values are realities, the only explanation is that the atomic weights vary. If in new experiments, in which the possibility of variation is kept in view, all discrepancies which actually exist should disappear, variation will be established beyond all doubt. It will then be in order to inquire into its cause. How the weights of the table have been obtained is, for the present, unessential; it is only necessary to add that column v contains Prof. Clarke's recalculated weights, and column u the same values calculated from the weights of column t, column x giving the number of atoms represented in each instance. Column w shows the corresponding weights of the gaseous state. These columns have been added for the sake of comparison.

	s	t	u	v	w	x
Li	22	2·36559	7·412	7·0235	7·333	3
Ca	58	6·23656	39·0824	40·082	38·666	6
Na	70	7·52688	23·5842	23·051	23·333	3
K	118	12·68817	39·7564	39·109	39·333	3
Rb	256	27·5269	86·2424	85·529	85·333	3
Mg	36	3·8537	24·15	24·014	24	6
Sr	132	14·1303	88·5498	87·575	88	6
Ba	206	20·05183	138·1915	137·007	137·333	6
Pb	306	32·7566	205·2748	206·946	204	6
Ag	324	34·683467	108·6748	107·923	108	3
Cs	398	42·605	133·496	132·918	132·666	3
H	3	0·31915	1	1·0023	1	3
N	14	1·48936	14	14·029	14	9
O	24	2·55319	16	16	16	6
F	58	6·04166	18·93	19·027	19·333	3
Cl	107	11·14583	34·9236	35·451	35·666	3
Br	243	25·3125	79·3125	79·951	81	3
I	387	40·3125	126·313	126·848	129	3
B	11	1·14583	10·771	10·966	11	9
G	14	1·45833	9·072	9·106	9·333	6
C	18	1·875	11·75	12·0011	12	6
Si	22	2·29166	28·722	28·26	29·333	12
Al	28	2·9166	27·416	27·075	28	9
P	32	3·3333	31·33	31·029	32	9
Ti	42	4·375	54·833	49·961	56	12
La	44	4·5833	143·61	138·844	146·666	30
S	48	5	31·33	32·058	32	6
Di	50	5·20833	146·875	144·906	150	27
Yt	60	6·25	88·125	90·023	90	13·5
Yb	62	6·45833	182·125	173·158	186	27
Ce	64	6·6666	139·26	140·747	142·222	20
Sc	66	6·875	43·0833	44·081	44	6
Zr	68	7·0833	88·7777	89·573	90·666	12
Ga	72	7·5	70·5	68·963	72	9
As	76	7·9166	74·417	75·09	76	9
V	78	8·125	50·9166	51·373	52	6
Cr	80	8·3333	52·222	52·129	53·333	6
Mn	84	8·75	54·833	54·029	56	6
Fe	86	8·9583	56·139	56·042	57·333	6
Ni	90	9·375	58·75	58·062	60	6
Co	91	9·4792	59·403	59·023	60·666	6
Sn	92	9·5833	120·11	117·968	122·666	12
Cu	96	10	62·666	63·318	64	6
Nb	98	10·20833	95·95833	94·027	98	9
Zn	100	10·4166	65·278	65·054	66·666	6
Ta	106	11·04166	184·5186	182·562	188·444	16
Se	120	12·5	78·333	78·978	80	6
Sb	126	13·125	123·375	120·231	126	9
W	142	14·79166	185·3888	184·032	189·333	12
Mo	150	15·625	97·9166	95·747	100	6
Cd	170	17·7083	110·972	112·092	113·333	6
In	176	18·3333	114·888	113·659	117·333	6
Th	178	18·54166	232·389	233·951	237·333	12
U	184	19·1666	240·222	239·03	245·333	12
Te	196	20·4166	127·945	128·254	130·666	6
Au	204	21·25	199·75	196·606	204	9
Bi	216	22·5	211·5	208·001	216	9
Ir	300	31·25	195·833	193·094	200	6
Pt	304	31·6666	198·444	194·867	202·666	6
Hg	306	31·875	199·75	200·171	204	6
Os	308	32·0833	201·056	198·951	205·333	6
Ru	318	33·125	103·7916	104·457	106	3
Rh	320	33·3333	104·444	104·285	106·666	3
Pd	326	33·95833	106·403	105·981	108·666	3
Tl	618	64·375	201·708	204·183	206	3

San Francisco, California, July 24 E. VOGEL

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The following gentlemen were on Monday, November 3, elected to Fellowships at St. John's College:—C. M. Stewart, M.A., First Class in Natural Sciences Tripos of 1879, author of several papers on chemical subjects, and Master